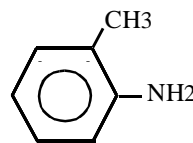


o-TOLUIDINE

o-Toluidine is a federal hazardous air pollutant and was identified as a toxic air contaminant in April 1993 under AB 2728.

CAS Registry Number: 95-53-4

Molecular Formula: C₇H₉N



o-Toluidine is a light yellow liquid that becomes reddish-brown on exposure to air and light. It is slightly soluble in water, soluble in alcohol, ether, and dilute acids, and miscible with carbon tetrachloride, diethyl ether, and ethanol. When heated, o-toluidine emits toxic fumes of nitrogen oxides (NTP, 1991). o-Toluidine is also combustible (Sax, 1987).

Physical Properties of o-Toluidine

Synonyms: 2-aminotoluene; o-methylaniline; o-aminotoluene; 2-toluidine; 2-methylaniline

Molecular Weight:	107.15
Boiling Point:	200 - 202 °C
Melting Point:	-14.7 °C
Flash Point:	85 °C (185 °F) closed cup
Vapor Density:	3.69 (air = 1)
Density/Specific Gravity:	1.004 at 20/4 °C (water = 1)
Vapor Pressure:	1 mm Hg at 44 °C
Log Octanol/Water Partition Coefficient:	1.32
Conversion Factor:	1 ppm = 4.4 mg/m ³

(HSDB, 1991; Merck, 1983; Sax, 1989; U.S. EPA, 1994a)

SOURCES AND EMISSIONS

A. Sources

o-Toluidine is used primarily as an intermediate in the manufacture of dyes which are used in printing textiles, as biological stains, and in color photography. It is also used in making colors fast to acid and as a vulcanization accelerator. o-Toluidine is reported to be a component of tar produced by low-temperature carbonization of coal and it is present in cigarette smoke. It is also released into the environment during thermal degradation of polyurethane products (HSDB, 1991).

B. Emissions

No emissions of o-toluidine from stationary sources in California were reported, based on data obtained from the Air Toxics “Hot Spots” Program (AB 2588) (ARB, 1997b).

C. Natural Occurrence

No information about the natural occurrence of o-toluidine was found in the readily-available literature.

AMBIENT CONCENTRATIONS

No Air Resources Board data exist for ambient measurements of o-toluidine.

INDOOR SOURCES AND CONCENTRATIONS

No information about the indoor sources and concentrations of o-toluidine was found in the readily-available literature.

ATMOSPHERIC PERSISTENCE

Using a rate constant for the gas-phase reaction with the hydroxyl (OH) radical equal to that for aniline, the calculated half-life and lifetime of o-toluene due to reaction with the OH radical is estimated to be 2 hours and 3 hours, respectively (Atkinson, 1995).

AB 2588 RISK ASSESSMENT INFORMATION

Since no emissions of o-toluidine from stationary sources in California have been reported under the AB 2588 program, it was not listed in any of the risk assessments reviewed by the Office of Environmental Health Hazard Assessment.

HEALTH EFFECTS

Probable routes of human exposure to o-toluidine are inhalation, ingestion, and dermal contact (HSDB, 1991).

Non-Cancer: Exposure to o-toluidine may cause methemoglobinemia, central nervous system depression, and toxicity to the kidneys and bladder. Signs and symptoms include anemia, anorexia, weight loss, skin lesions, dizziness, and cyanosis (U.S. EPA, 1994a).

The United States Environmental Protection Agency (U.S. EPA) has not established a Reference Concentration (RfC) or an oral Reference Dose (RfD) for o-toluidine (U.S. EPA, 1994a).

Limited information is available regarding adverse reproductive or developmental effects of o-toluidine. An increased number of offspring in mice, after injection with o-toluidine during gestation, was reported in a study from Russia (U.S. EPA, 1994a).

Cancer: Epidemiological evidence has associated occupational exposure to o-toluidine with an increased risk of bladder cancer among workers. The U.S. EPA has placed o-toluidine (2-methylaniline) in Group B2: Probable human carcinogen (U.S. EPA, 1994a). The International Agency for Research on Cancer has placed o-toluidine in Group 2B: Possible human carcinogen (IARC, 1987a).

The State of California has determined under Proposition 65 that ortho-toluidine is a carcinogen (CCR, 1996). The inhalation potency factor that has been used as a basis for regulatory action in California is 5.1×10^{-5} (microgram per cubic meter)⁻¹ (OEHHA, 1994). In other words, the potential excess cancer risk for a person exposed over a lifetime to 1 microgram per cubic meter of o-toluidine is estimated to be no greater than 51 in 1 million. The oral potency factor that has been used as a basis for regulatory action in California is 1.8×10^{-1} (milligram per kilogram per day)⁻¹ (OEHHA, 1994).

